

# **TRICOLORED HANDLE STRUCTURE FOR SCREWDRIVER**

## **BACKGROUND OF THE INVENTION**

### **Field of the Invention**

The present invention relates to a hand tool, and more  
5 particularly to a tricolored handle structure for screwdriver.

### **Description of the Prior Arts**

Conventional handle structure for a screwdriver discloses a tool  
handle which is made by method of plastic ejection molding, wherein  
core handle is partially coated with plate-structured soft layer, so as to  
10 improve the grip. The other conventional handle structure for a  
screwdriver discloses a tool handle which is made by extrusion forming  
method, wherein the soft layer is coated on the core handle along the  
longitudinal direction. Another conventional handle structure for a  
screwdriver also discloses a tool handle made of buffering material,  
15 which is double colored (made by double ejection molding). Another  
conventional handle structure for a screwdriver discloses a tool handle  
which is made of two different materials.

The above-mentioned tool handles are made by two ejection  
molding processes, in first process the core handle is made and then soft  
20 layer is coated on the core handle in second process, and thus a double  
colored handle is formed. After that, a rod is inserted in the front of the  
handle. With this manner, the formed handle has only two colors,  
furthermore, it cannot be formed with trademark or patterns during the

ejection molding process. Therefore, the production cost must be increased if print the trademark by mother methods after the handle is formed.

The present invention has arisen to mitigate and/or obviate the  
5   afore-described disadvantages of the conventional handle structure for screwdriver.

### **SUMMARY OF THE INVENTION**

The primary object of the present invention is to provide a tricolored handle structure for screwdriver. The tricolored handle  
10   structure is provided along the axial direction with a rod which extends outward from the handle, the handle has a hard-plastic made first core handle integrally melted with a hard-plastic made second core handle and then being coated with a soft third layer, the first core handle has at least a hard first pattern portion, the second core handle has at least a hard  
15   second pattern portion, wherein the first pattern portions and the pattern portion are not coated by third layer, the first pattern portion, the second pattern portion and the third layer are different colored and form a smooth surface of the handle.

The present invention will become more obvious from the  
20   following description when taken in connection with the accompanying drawings, which shows, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a perspective view of a tricolored handle structure for screw driver with a rod in accordance with the present invention;

Fig. 2 is longitudinal cross sectional view of showing the  
5 condition of a tricolored handle structure for screw driver with a rod in accordance with the present invention in the third process ejection molding process;

Fig. 3 is longitudinal cross sectional view of showing the  
condition of a tricolored handle structure for screw driver with a rod in  
10 accordance with the present invention in the second process ejection molding process;

Fig. 4 is longitudinal cross sectional view of showing the  
condition of a tricolored handle structure for screw driver with a rod in  
accordance with the present invention in the first process ejection  
15 molding process;

Fig. 5 is an upside view of a tricolored handle structure for screw driver with a rod in accordance with the present invention in the first process ejection molding process.

Fig.6 is an outside view of the final products of a tricolored  
20 handle structure for screwdriver in accordance with the present invention.

## **DETAILED DESCRIPTION OF THE PREFERRED** **EMBODIMENT**

Referring to Figs. 1 and 2, wherein a screwdriver with tricolored handle in accordance with the present invention is shown and generally comprised of a handle 2 and from which a rod 1 extends outward along the axial direction of the handle 2. The principle characteristic of the screwdriver is that the handle 2 includes a hard-plastic made first core handle 21 integrally melted with a hard-plastic made second core handle 22 and then is coated with a soft third layer 23. The first core handle 21 includes at least a rigid first pattern portion 212 with pattern on it, such as a trademark 210, the second core handle 22 includes at least a rigid second pattern portion 225 with pattern printed on it, such as striate. And then the first and the second cores 21, 22, except the first and the second pattern portions 212, 225, are exteriorly coated with a third layer 23. The first pattern portion 212, the second pattern portion 225 and the third layer 23 form a tricolored smooth surface 231 of the handle 2.

Referring to Figs. 4 and 5, wherein a passage 20 is formed along the central axis of the first core handle 21 during the first process of ejection molding. The first core handle 21 is further provided with a protrusive first pattern portion 212 which will serve as a reference plane in next ejection molding process, on the first core handle 21 opposite to the first pattern portion 212 is formed with a sunken portion 213 which is defined with annular grooves, such that the first core handle 21 is possessed with rather even sectional area so as to prevent shrinkage distortion. The passage 20 serves to receive the rod 1 which serves as a

reference plane in the next process. The molds in accordance with the present invention are operated in circular manner, thereby the parting lines of the respective molds of the present invention can be solved if the reference line of the passage 20 is well controlled. The first and the  
5 second core handles 21, 22 are made of PVC which is hard but not impact resistant and has a SHORE D hardness of 65 to 75. The first pattern portion 212 can be formed with trademark 210 (such as Y.C as shown in Fig. 1), it is more easy to be made if the trademark 210 is flat-formed, but if it is curve-formed that the corresponding mould also  
10 should have the same curvature, so as to prevent plastic material intrusion in the next process. In order to be well integrated, the first and the second core handles 21, 22 are at least formed with a first annular groove 214 and a second annular groove 224 which to be filled up for the next process. The hard first core handle 21 also can be formed with a  
15 through hole 211 for reception of a tool rod.

Referring to Fig. 3, during the second process of ejection molding, the first core handle 21 formed in the first process is set in the second mold, the first pattern portion 212 and the passage 20 act as reference plane, and then the second mold is closed. There are spaces left  
20 in the mold for a second layer 223, an end layer 222, a hole layer 221 and the second pattern portion 225. When different colored hard plastics are melted and ejected into the mould, it will flow into the spaces of the second mold except the first pattern portion 212, and the sunken portion

213, the annular grooves 214 will be filled up, in this way, the second core handle 22 is formed. In order to be well integrated in next process, the core handle 22 is additionally formed with at least a second annular groove 224 which is to be filled up in the next process. Now the second  
5 core handle 22 is fairly close to final product form, it only needs to be coated with a soft layer.

Referring again to Figs. 1 and 2, or referring to Figs. 6 during third process of ejection molding, the formed second core handle 22 is set in a third mold which is then closed with the first pattern portion 212, the  
10 passage 20, the end layer 222 as reference plane. There is space left for the third layer 23. The first pattern portion 212 and the end layer 222 contact the surface of the third mold cavity. When different colored hard plastics are melted and ejected into the mould, it will flow into the space of the third mold except the first pattern portion 212, the end layer 222  
15 and the hole layer 221, so as to form a soft third layer 23, and meanwhile form the smooth surface 231 of the handle 2, that is that almost there is no height difference among the first pattern portion 212, the second pattern portion 225 and the third layer 23, it can hardly be observed by eye. The soft third layer 23 is made of thermo-elastoplastic material  
20 which have SHORE A hardness of 35 to 75 and thickness 5 cm for improving grip.

While we have shown and described various embodiments in accordance with the present invention, it should be clear to those skilled

in the art that further embodiments may be made without departing from the scope of the present invention.